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ADST
Version Description Document
for the
Rotary Wing Aircraft
BDS-D 1.0.0

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Table Of Contents

1. Scope.

This Version Description Document (VDD) contains a functional description of the Rotary Wing Aircraft (RWA) system, all modules in this release identified by version number, a set of build instructions, installation procedures, identification of any known problems, release notes and any essential data relationships that are a part of this release.

1.1 Identification.

This VDD defines the 5 November 1992 initial release of Rotary Wing Aircraft (RWA), release version BDS-D RWA 1.0.0.

1.2 System Overview.

Soldier in the loop simulators exist at the Aviation Test Bed (AVTB) located at Ft. Rucker, Alabama and the Close Combat Test Bed (CCTB) located at Ft. Knox, Kentucky. The simulators include Rotary Wing Aircraft (RWA, only at Ft. Rucker), M1 tanks, Bradley Fighting Vehicles, Fixed Wing Aircraft (FWA), a Management, Command and Control system (MCC), Non Line of Sight vehicle (NLOS, located at Ft. Knox only), and, finally, a Semi-Automated Forces system (SAFOR). The RWA provides major enhancements to the next generation of rotary wing simulations and develops reconfigurable simulators with improved visuals, sensor models, and flight dynamics.

1.3 Document Overview.

This document was prepared in accordance with DID DI-MCCR-80013A of DOD-STD-2167A and defines the 5 November 1992 release of the RWA software, Version BDS-D RWA 1.0.0. This release contains the initial software capture of the SIMNET RWA, Version 6.6.1.

2. Referenced Documents.

2.1 Government Documents.

DI-MCCR-80013A	Version Description Document, 29 February 1988
DOD-STD-2167A	Defense System Software Development, 29 February 1988

2.2 Non-Government Documents.

ADST/WDL/TR--92-00640-YR1	Advanced Distributed Simulation Technology System Definition Document, 28 October 1992
ADST/WDL/TR--92-003023	ADST Configuration Management Plan 30 November 1992
ADST/WDL/TR--92-003028	RWA Coldstart Procedures, 22 November 1992

3.   Version Description.

Version BDS-D RWA 1.0.0 of the RWA is to be installed at Fort Rucker, Alabama.

3.1   Inventory of Materials Released.

Listed below is the physical media and support documentation required to build, load and operate the RWA system. The RWA release version BDS-D RWA 1.0.0 consists of all the source code needed to build the system, executable and data files required to run the system and GTOS 4.7 operating system.

Type	ID No.	Title
DC 6150 Tape		BDS-D 1.0.0 RWA Initial 6.6.1 T/O GTOS 4.7 Operating System
Document	ADST/WDL/TR--92-003028	RWA Coldstart Procedures
Document	ADST/WDL/TR--92-003027	RWA BDS-D 1.0.0 VDD

3.2   Inventory of CSCI Contents.

Appendix D provides a listing of all RWA CSCI source files which were used to create release BDS-D RWA 1.0.0. All source files reside on the Configuration Management and Control Sun Sparc workstation and are configuration controlled using the Revision Control System (RCS).

3.3   Changes Installed.

Since RWA release version BDS-D RWA 1.0.0 captures the SIMNET 6.6.1 software product baseline, no SP/CRs were written and/or included in this release.

3.4   Adaptation Data.

Adaptation data is contained in human editable files which allow modification to the flight model and weapon's system.

3.5   Coldstart Procedures.

The separate RWA Cold Start Procedures, document no. ADST/WDL/TR--92-003028, provides detailed cold start instructions for the BDS-D RWA 1.0.0 release.

3.6   Build Instructions.

Appendix B provides detailed build instructions for the RWA BDS-D 1.0.0 initial software release.

3.7   Regression Test Results.

RWA regression test scenario and results are included in appendix A.

3.8   Release Notes.

3.8.1 RWA BDS-D 1.0.0 Software Release Notes.

No release notes available for the RWA BDS-D 1.0.0 application software initial release.

3.8.2 GTOS5.7 Operating System Software Release Notes.

Appendix D contains the GTOS5.7 Operating System software release notes prepared by BBN Systems and Technologies Corporation.

3.9. Interface Compatibility.

This release remains compatible with the SIMNET interfaces.

3.10. Bibliography.

> Management, Command and Control System (MCC) Operations Documentation Report No. IEITR-74563; 15 March 1990.

3.11. Summary of Changes.

Initial release. No summary of changes to baseline are available.

3.12. Installation Instructions.

Appendix C contains the current build installation procedures for the BDS-D RWA 1.0.0 version release.

3.13. Possible Problems and Known Errors.

There are no open SP/CR's pertaining to this system release.

4.   Notes.

The following is a list of acronyms used in this document.

ADST	Advanced Distributed Simulation Technology
AVTB	Aviation Test Bed
BBN	Bolt, Beranek, & Newman
CCTB	Close Combat Test Bed
FWA	Fixed Wing Aircraft
MCC	Management, Command and Control system
NLOS	Non Line of Sight
RWA	Rotary Wing Aircraft
SAFOR	Semi-Automated Forces system
SIMNET	
SP/CRs	Software Problem/Change Reports
VDD	Version Description Document

Appendixes.

Appendix A   RWA Regression Test Results

RWA Simulator Testing Scenario

PURPOSE: To set up RWA test conditions from MCC

1.)   Ensure that the Master Command & Control (MCC), RWA simulator, Plan View Display (PVD) and Stealth are not in use. Place the MCC in an initialization mode by rebooting the Simnet Control Console (SCC) Macintosh. Place the RWA simulator in the initialization mode by following the RWA Simulator Startup Procedure selecting MCC control. At the RWA, the last message to appear on GT1 will be: SYSTEM INITIALIZATION COMPLETE.

2.)   At the MCC, the Simnet MCC main screen will be displayed. Mouse-click the [START] button. When the "Exercise Initialization" screen appears, select the [NEXT] button, repeat for the next three (3) screens. This sets up default conditions. For the next screen, select A Company [DEFENSE] button, B Company [OFFENSE] button, C Company [NON-PARTICIPANT] button and D Company [NON-PARTICIPANT] button. Then select [NEXT] button. The next screen will ask if all is OK or changes are to be made. Select OK to start the exercise.

3.)   The next screen will contain several selection icons. Select [Simulator Allocation] then select [GO]. A screen labeled "Vehicle Simulator Allocation" will appear. Select the table entry marked "8B FRED UNASSIGNED" (This entry corresponds to the RWA simulator). This will open up to a configuration menu. Select the [A COMPANY] button, then select [OK] button. This screen will close down and show that Simulator 8B FRED is assigned to A company. Select the [OVERVIEW] button to return to the Exercise Initialization screen.

4.)   Select [VEHICLE PLACEMENT] then [GO]. This will bring up the Vehicle Placement screen. Select [A COMPANY] then [NEXT]. A screen labeled "Vehicle Simulator Initialization" will appear for A Company. Select the entry for Simulator 8B, a new screen will open for vehicle specific entry. On the next screen, select the [DEFENSE] button. Then enter the number 1 in the "Bumper Number" field and press the "tab" key. Enter "es742779" in the "Location" field and press the "tab" key. Enter "1800" in the "Azimuth" field and then select the [PLACE] button with the mouse. The screen will close down and the screen will show the 8B FRED Simulator placed at the location you entered. Select the [OVERVIEW] button to return to the exercise initialization screen.

5.)   Select [BATTLEMASTER FUNCTIONS] then [GO]. A password screen will appear. Enter the battlemaster password (foozball) and a new screen will appear containing the battlemaster functions. Select [GUNNERY TARGETS] then [GO]. A screen labeled "Gunnery Targets" will appear. Enter the following in order:

   NOTE: [ ] indicates a mouse-click entry, < > indicates user input.

      [NEW TARGET] <tgt1> tab-key <es854773> tab-key <4800> [OK]
      [NEW TARGET] <tgt2> tab-key <es839773> tab-key <4800> [OK]
      [NEW TARGET] <tgt3> tab-key <es839773> tab-key <4800> [OK]
      [NEW TARGET] <tgt4> tab-key <es839773> tab-key <4800> [OK]

[NEW TARGET] <tgt5> tab-key <es818772> tab-key <6000> [OK]
[NEW TARGET] <tgt6> tab-key <es818773> tab-key <6000> [OK]
[NEW TARGET] <tgt7> tab-key <es817774> tab-key <5800> [OK]
[NEW TARGET] <tgt8> tab-key <es804781> tab-key <5000> [OK]
[NEW TARGET] <tgt9> tab-key <es783806> tab-key <5800> [OK]
[NEW TARGET] <tgt10> tab-key <es771809> tab-key <4000> [OK]
Select [OVERVIEW] to return to battlemaster functions.

6.) Ensure that the RWA has initialized in the database by observing that the database terrain is displayed on the 7 TV monitors above the RWA cockpit, the high resolution channel is operational by observing that there is a picture displayed on the TV monitor at the Co-pilot-gunner (CPG) station, and the sound is on.
NOTE: for the remainder of this paragraph, "R-M-C" means "Click the right mouse button" On the Plan View Display (PVD), in the lower right hand corner of the screen, in the block labeled "Other Menus", R-M-C until "Top Menu 1" is displayed. Then in the block labeled "DATABASES", ensure that the "FT_KNOX" box contains an "X". If not, R-M-C on the FT_KNOX box to select it. (If FT_KNOX was not selected, the displayed map will be redrawn. This may take a few minutes.) Then in the block labeled "MAP FEATURES", R-M-C the box containing "SET GRID" until "SET GRID OFF" is displayed. Then R-M-C the selection in "OTHER MENUS" labeled "Top Menu 1". You will now be in Menu 2. In the block labeled "MAP MANIPULATION", R-M-C the selection "Top Level". The cursor will turn into a "wait" icon and the map will be displayed at full view. At this point, the PVD map display will display: rivers, roads, tree lines, lakes, tree canopies, and icons representing vehicles. Now, move the cursor onto the map until the tail of the cursor is positioned in the lower right hand corner of the grid block located third from top and fourth from left. Holding the left mouse button down, drag open a window outlining the grid square which contains the target icons and release the mouse button. Then move the cursor to the "MAP MANIPULATION" block and R-M-C on the "Zoom In" selection. The cursor will turn into a "wait" cursor. Wait approx. two minutes and the map will display a close-up view of the gaming area.

7.) Lift off in the RWA simulator, fly a heading of 120 degrees at an altitude of about 150 ft Above Ground Level (AGL) until reaching location "ES866734" (displayed on the Situation Awareness Display (SAD)). Turn left to 350 degrees and fly to location "ES863763". Go into a "hover" at about 100 ft AGL, the Co-Pilot-Gunner (CPG) will select Hellfire, acquire a lock on the target located directly ahead, fire a missile holding the laser trigger down, if the target is not destroyed, repeat firing until a kill is achieved. The pilot will then fly a heading of 250 degrees along the road where several other targets are located, destroy the remainder of targets using Hellfires and gun. During the flight, the pilot will execute maneuvers necessary to test the flight characteristics of the RWA helicopter.

8.) The test is concluded by returning to the MCC SCC console, entering the Battlemaster Functions screen, and selecting [End Exercise] then [go]. Then answer [yes] to the confirmation question. At this time, the RWA simulator will stop.

Appendix B   RWA Build Instructions

1. Once all the code is in the respective RWA directory and in RCS, log on to the SUN system on *adst30* under the *cm-adst* account.

2. The RWA delivery order is divided into common and simnet software. The common software must be built first. Set the default directory to common.

      cd common

If you want to build from scratch, remove all the library (*.a) and object files (*.o) by executing a make clean.

      make clean   (deletes all *.a and *.o files)

If you only want to build those object modules that changed as a result of the source file being modified, then only delete the associated object files. Set default to the directory where the object module is located and delete it.

      cd RWA/common/libsrc/libmem
      rm filename.o

3. Execute the following set of commands to build the RWA common environment from scratch:

      make checkout (Fetches a read-only copy of all source files from RCS if the
                          latest version doesn't already exist in the local directory).
      make install   (Compiles source and creates object files. It will not compile
                    error free).

If you want to produce a log file for standard output and error log messages, enter the following command:

      (make install > rwa_common_install.stdlog)>& rwa_common_install.errlog

These log files will be located in the default directory (/RWA/common).

4. Execute the following set of commands to build the RWA simnet environment from scratch:

      cd ../simnet
      make headers (Moves archive files and headers)
      make install   (Compiles source and creates object files. It will not compile
                    error free).
      make all   (Copies rwa executable to the bin directory).

(If you want to produce a log file for standard output and error log messages, enter the following command:

      (make install > rwa_simnet_install.stdlog)>& rwa_simnet_install.errlog

These log files will be located in the default directory (/RWA/simnet).

5. To build only the files that change, delete the object file(s) that are being changed, and copy the modified file(s) from turnover to the designated rwa directory and execute only the make install command as discussed in Steps 3 and 4 of this procedure.

6. A successful compilation and link produces an executable called rwa. It is located in the /RWA/simnet/vehicle/rwa/src directory.

7. Create two tapes with the the rwa executable and data files for testing using the following tar commands:

    cd /RWA/vehicle/rwa/src
    tar cvf adst1:/dev/rst0 rwa

    cd /RWA/data/vehicle/data
    tar cvf adst1:/dev/rst0 *.d

Appendix C   Installation Instructions

RWA   Software   Installation   Instructions

PURPOSE: To install a software release

1.)   After the GT111 system has been powered up, a "GT-0>" prompt will be displayed on the console. The release to be installed will be furnished on 150mb cartridge tapes in "tar" format. Install the tape containing the RWA release executable (rwa) into the tape drive, wait until the tape rewinds to Beginning of Tape (BOT) (indicated by the LED on the front of the tape drive changing from red to solid green. This may take a minute or so depending on where the tape is positioned in the cartridge).

2.)   The RWA executable belongs in the directory A:/SIMNET/BIN. When step 1 has been successfully performed, at the GT-0> prompt, enter the following commands:
        NOTE: <cr> indicates the "return" key is pressed.

        cd /simnet/bin <cr>
        tar xv <cr>
(The rwa executable (rwa) will be read in from tape.)
        cd <cr>
Remove the tape from the tape drive.

3.)   If the release contains related data files, these belong in the directory A:/SIMNET/DATA. When step 2 has been successfully performed, at the GT-0> prompt, insert the tape containing the data files into the tape drive and wait for the LED on the tape drive to go to solid green. Then enter the following commands:

        cd /simnet/data <cr>
        tar xv <cr>
(The rwa data file(s) will be read in from tape.)
        cd <cr>

4.)   The installation is now complete. Remove the tape cartridge from the tape drive and reboot the system by entering "reboot" at the GT-0> prompt.

Appendix D GTOS5.7 Release Notes

Appendix E   RWA source listings

RWA BDS-D1.0.0 Prologue Description

The baseline code for RWA BDS-D 1.0.0 is documented in listings attached to this Appendix. Starting at the top of the RWA directory tree, a history of each file is produced from the Revision Control System (RCS) subdirectories. All baselined RWA files are checked into the RCS subdirectories. RCS files (denoted by the ",v") and its corresponding working file make up each directory in the RWA directory tree. Along with each filename is a brief description of the reason for the check in. For example, "Initial Turnover - BBN's 6.6.1" documents the reason for checking the code into RCS. RCS automatically supplies a version number. Each file checked into RCS is a given version number of 1.1. Version numbering is incremented in tenths (1.2, 1.3, 1.4, etc.,).

A snapshot of what was turned over by BBN and successfully built and tested was brought under LORAL configuration management control via RCS and assigned a release number of BDS-D RWA 1.0.0. BDS-D RWA 1.0.0 consists of all the source code required to produce the RWA executable, and configuration and data files necessary to run the RWA application.

RWA Common Software Listings